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(54) Sealing, trimming or guiding strip for a vehicle

(57) A sealing, trimming and guiding strip, preferably for the window of a motor vehicle, has a first one-piece moulding 10, 40 and a second part 11, 54 of, or including, extruded material and which may, at least partially, embed a metal reinforcing carrier 16. The first moulding is either adhesively secured to the second extruded part (figure 2), moulded onto it, or held in juxtaposition with it by means of a rigid mounting channel forming part of the window frame (figure 3). The first part 10, 40 may be moulded from a thermoplastic olefin (TPO) for aesthetic effect and the second parts 11, 54 may be extruded from EPDM to give good sealing properties. A further one-piece moulding 56 may also be secured to the part including the extruded material (figure 5 and figure 6 (not shown)).

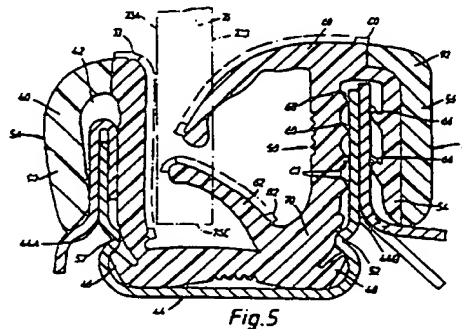
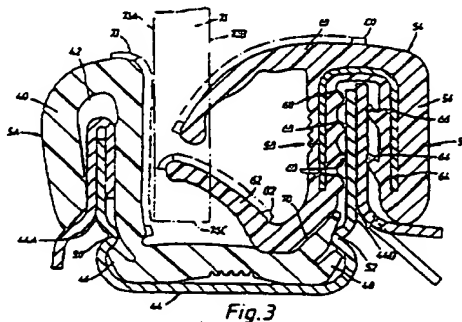
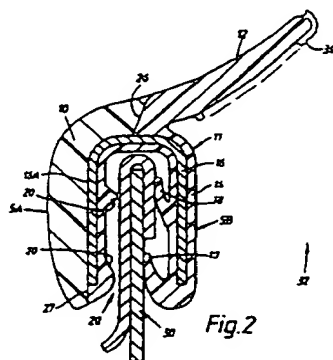
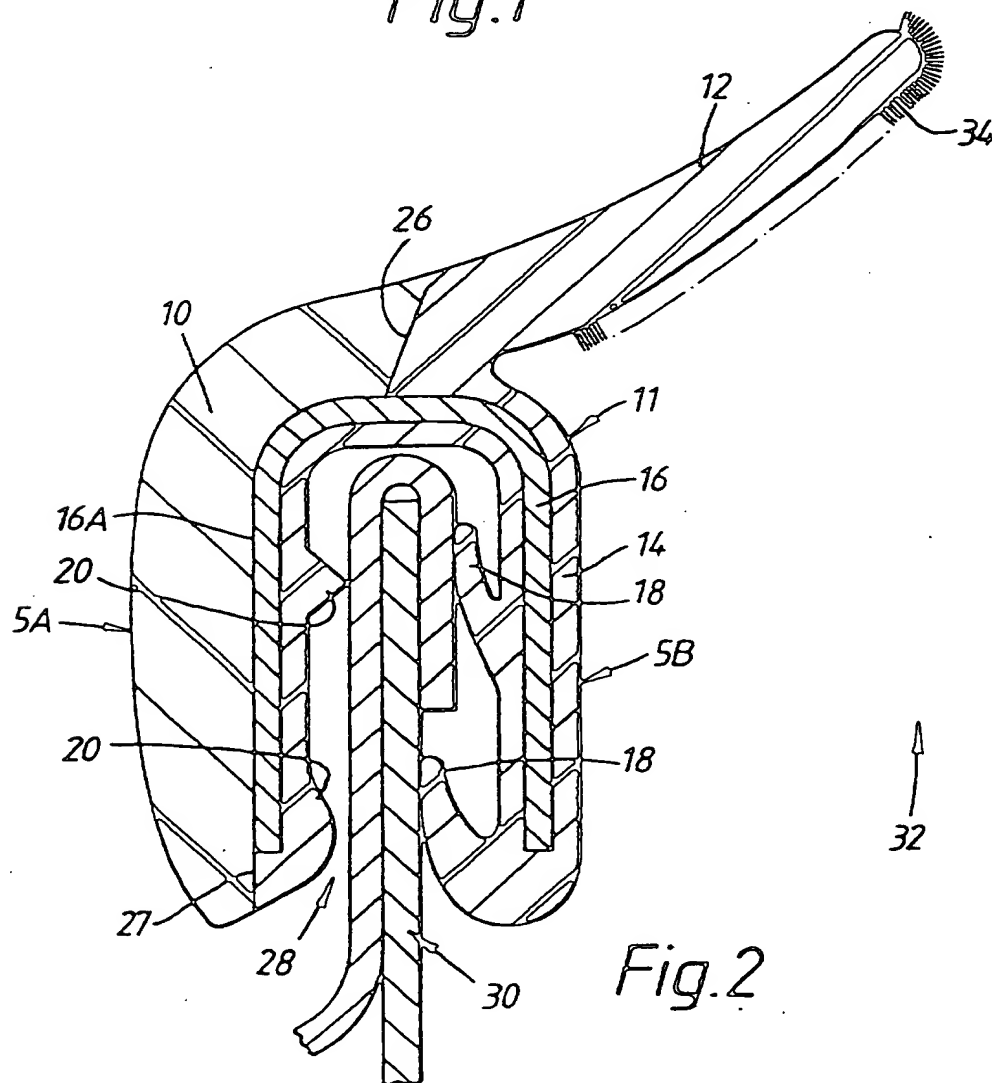
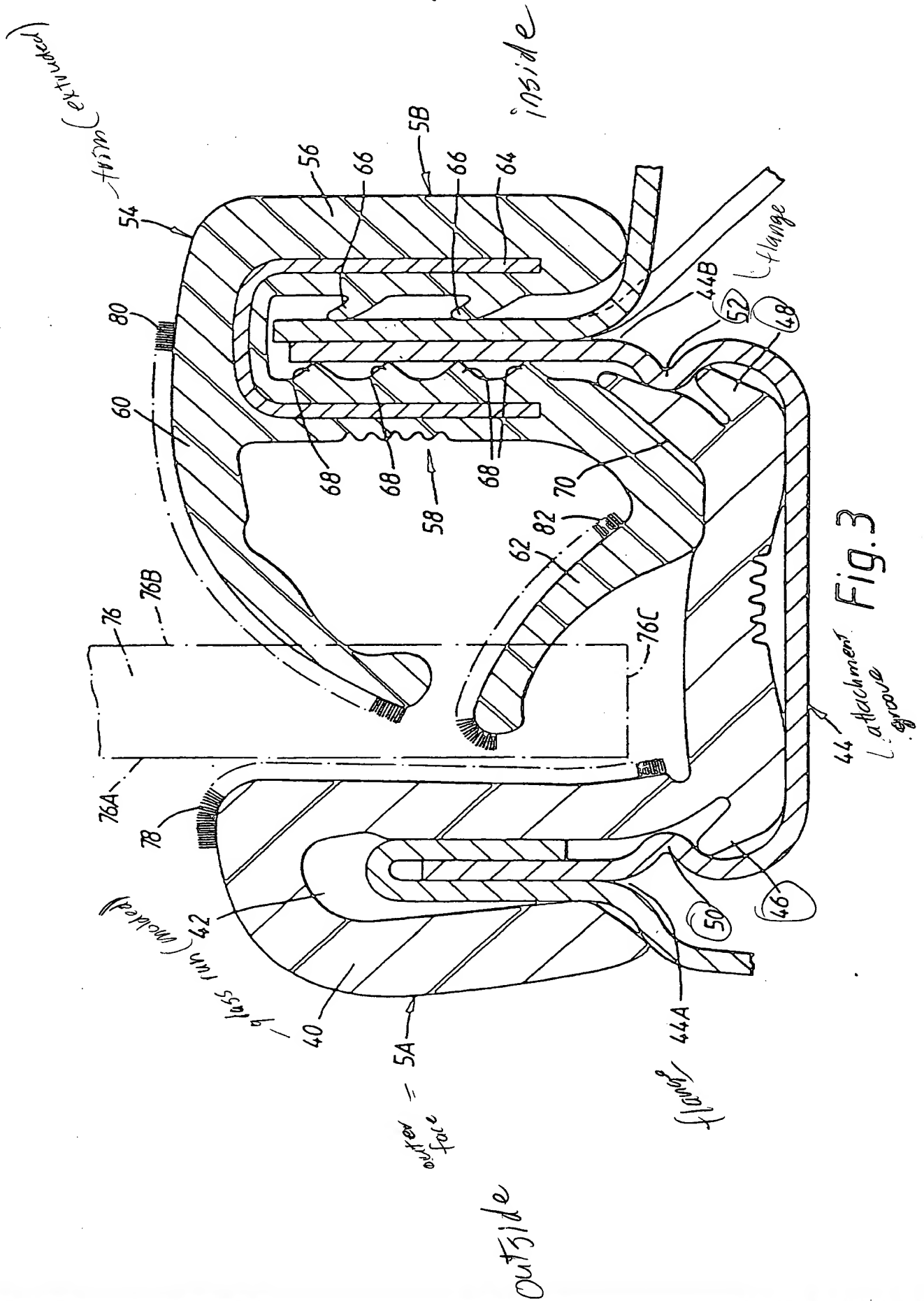


Fig.1





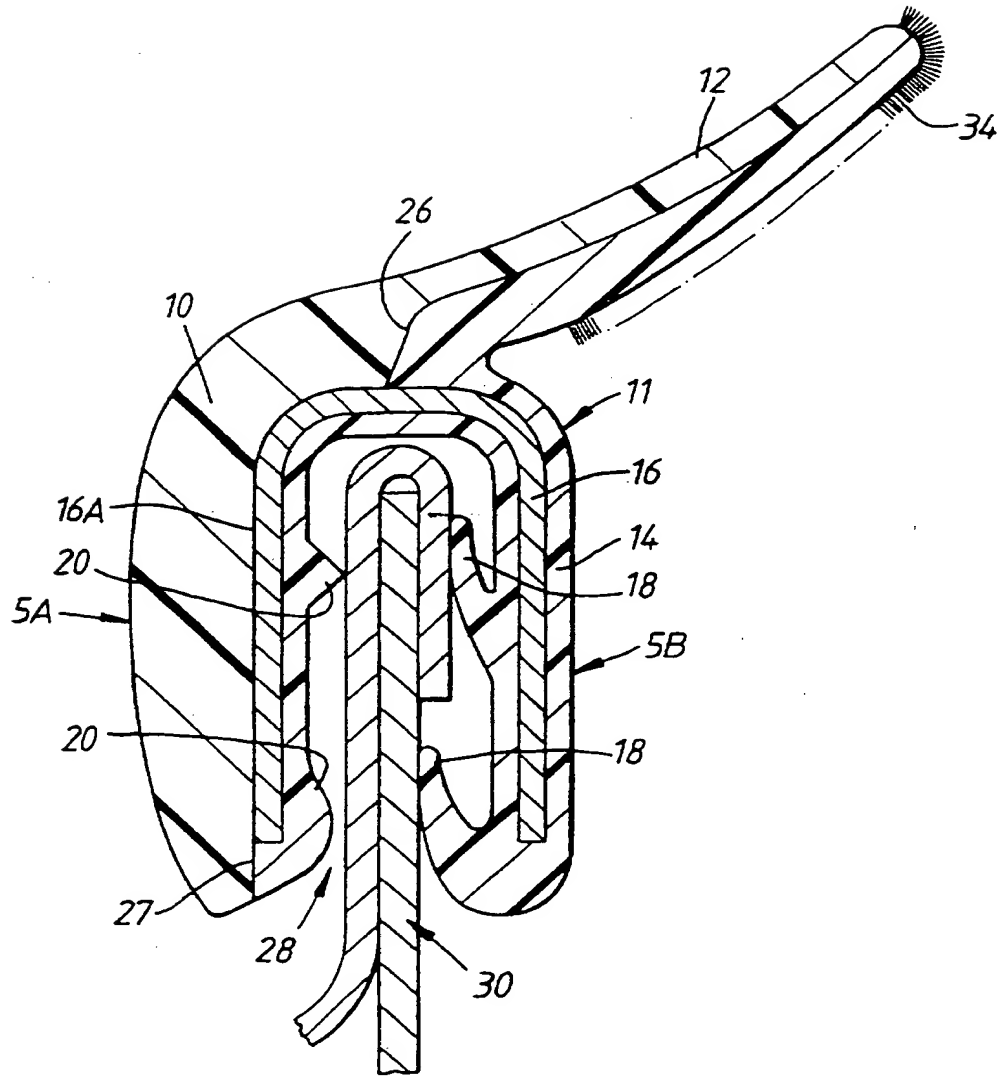


Fig. 4

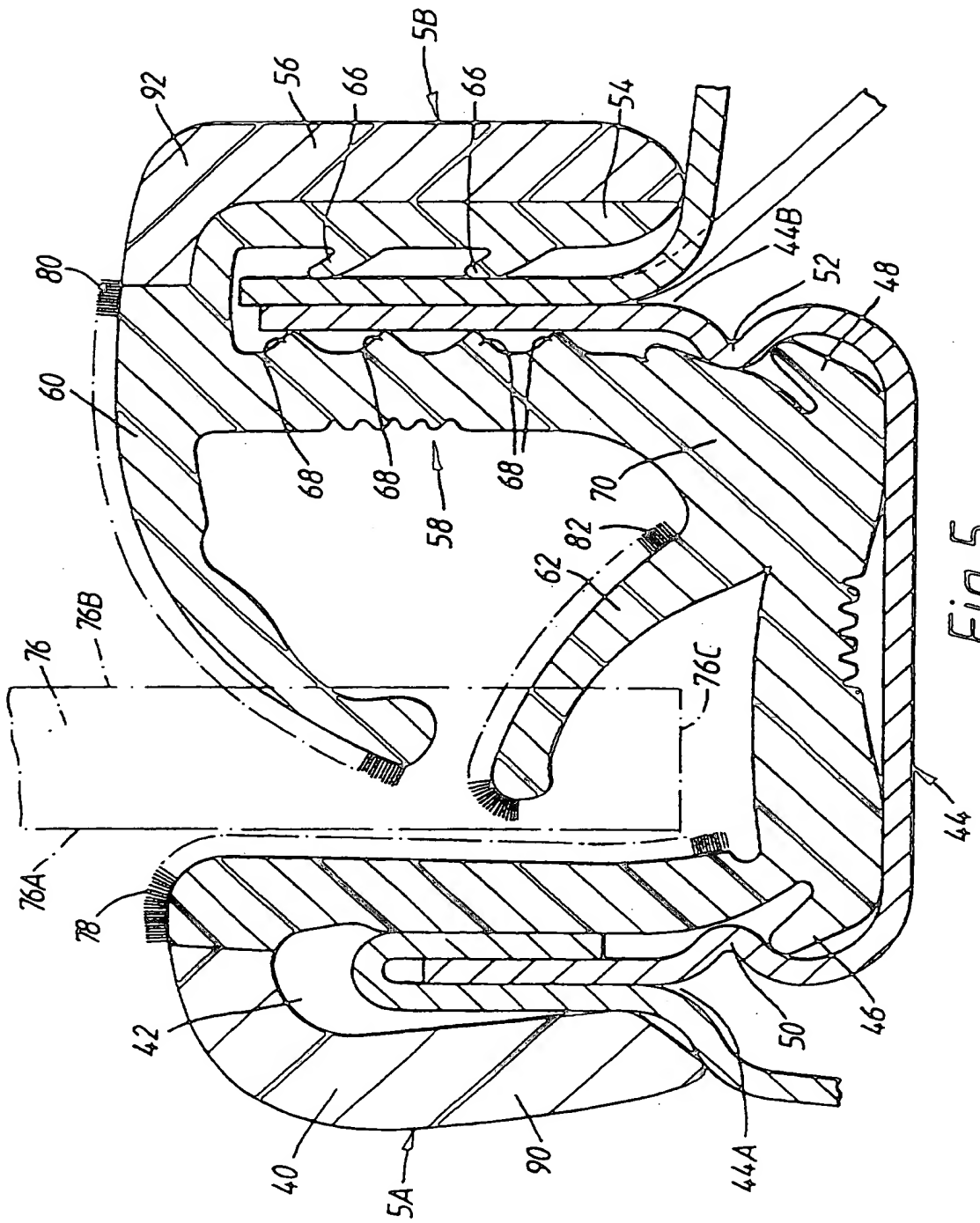


Fig. 5

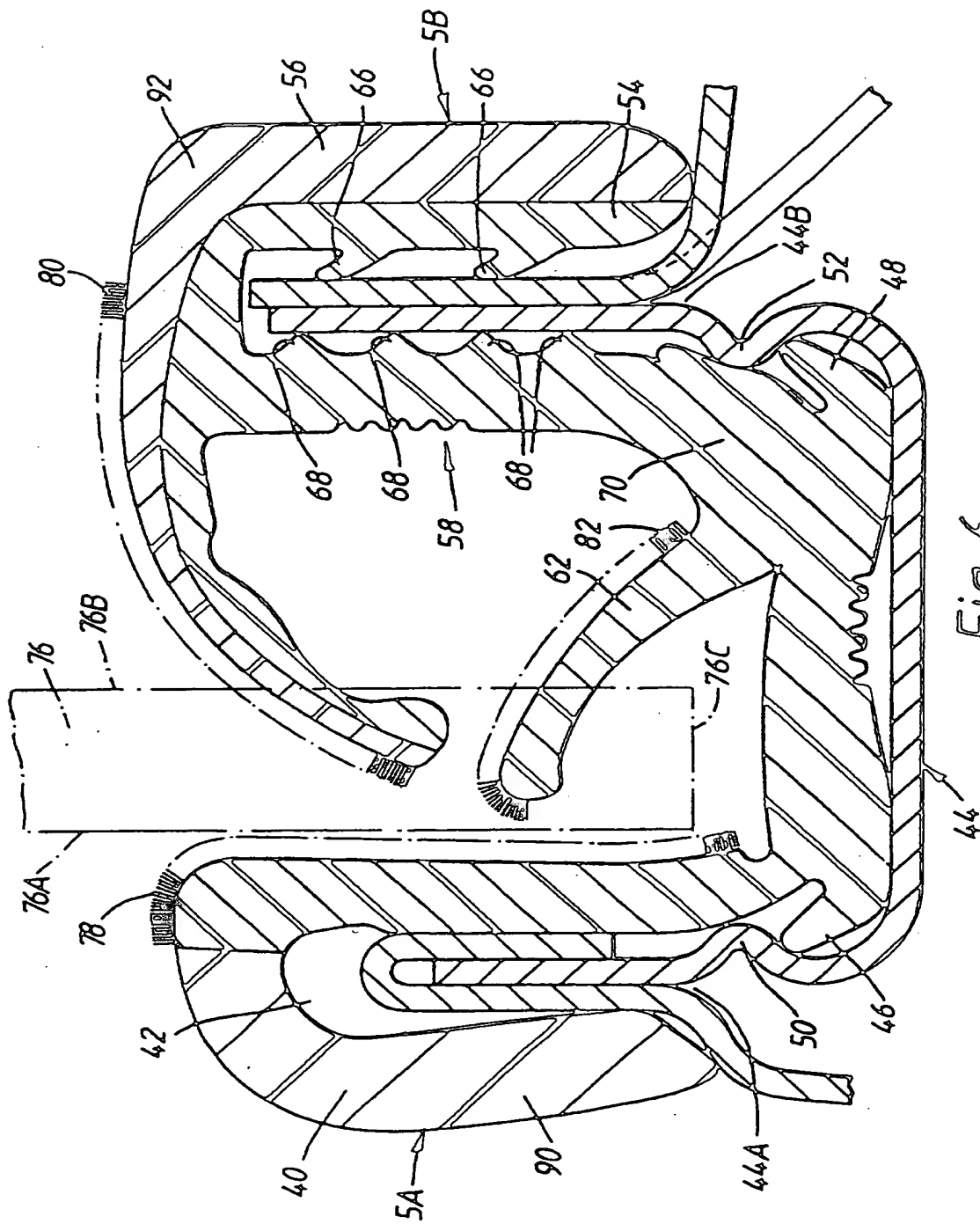


Fig. 6

SEALING, TRIMMING OR GUIDING STRIPS

The invention relates to sealing, trimming or guiding strips. Strips embodying the invention, and to be described in more detail below by way of example only, are for use in sealing, trimming and guiding window glass in motor vehicle body construction.

According to the invention, there is provided a sealing, trimming or guiding strip, comprising first strip means extending along the length of the strip and defining a first longitudinally extending face thereof and second strip means extending along at least part of the length of the strip and defining the second, opposite, longitudinally extending face of the strip, at least one said strip means being of one-piece moulded construction and the strip incorporating longitudinally extending extruded material.

According to the invention, there is further provided a sealing, trimming or guiding strip for a window frame in a motor vehicle body, the strip comprising first strip means defining a first longitudinally extending face of the strip, the first strip means

being in the form of a continuous closed loop produced by a single moulding operation and having at least one sharp angled corner matching a sharp angled corner of the window frame, and second strip means extending longitudinally along the strip and around the closed loop of the first strip means to define the second, opposite, longitudinal face of the strip and incorporating extruded material, the first face of the strip being the face of the strip intended to be on the outside of the vehicle in use and the second face being the face intended to be on the inside of the vehicle in use.

Other features and aspects of the invention will also be disclosed.

Sealing, trimming or guiding strips for vehicles will now be described, by way of example only, with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a side view of one of the strips;

Figure 2 is a cross-section on the line II-II of Figure 1; and

Figure 3 is a cross-section on the line III-III of Figure 1.

Figure 4 is a view corresponding to Figure 2 showing a modified version of one of the strips.

Figure 5 is a view corresponding to Figure 3 showing a modified version of one of the strips.

Figure 6 is a view corresponding to Figure 5 showing a further modified version of one of the strips.

The sealing, trimming or guiding strip indicated generally at 5 in Figure 1 is for use in the window opening of the upper part of a vehicle door. In particular, the strip 5 may be used for the window opening in the rear door of a vehicle. The strip thus has a first part surrounding a window opening 6 in which a window glass (not shown) can move in a vertical direction, being raised from and lowered into the lower part of the vehicle door. The second part of the strip 5 defines an opening 8 in which is received a fixed window pane (forming the so-called "quarter light" of the rear door). A cross piece 9 is common to both parts of the seal. The strip 5 around the window opening 6 thus defines channels along the vertical sides and the top of the opening 6 and a seal extending alongside a gap which runs along the horizontal part, or waist. The window glass passes through

this gap as it rises from or is lowered into the lower part of the door. Around the whole of the opening 8, the strip defines a channel for receiving the fixed piece of window glass. Figure 1 views the strip 5 from outside the vehicle.

In accordance with a feature of the invention, the strip 5 is partially of moulded construction and partially of extruded construction. Thus, the whole of the strip 5 surrounding the opening 8, including the cross piece 9, is produced by a moulding operation, and is integrally moulded with the part of the strip defining the face of the remainder of the strip on the outside of the vehicle, that is, the face of the strip is extending around the opening 6 from the point A through the point B to the point C. The moulded part is produced in a single moulding operation from thermoplastic olefin material (TPO) and is thus produced in a single piece. Thus, the necessary sharp corners at A, B and C are easily produced by the moulding operation. TPO is an advantageous material to use for the moulding operation because it has a good appearance, is easily moulded (the mould itself requires much less frequent cleaning than when using other materials such as rubber) and it can be easily produced in different colours.

Figure 2 shows how, over the region BC, the outer face 5A of the strip is defined by the moulded TPO material 10 while inner face of the strip (that is, the face 5B of the strip on the inside of the vehicle) is formed by the face of a channel-shaped structure 11 carrying a lip 12. The channel-shaped structure 11 is made of extruded EPDM material 14 in which is partially embedded a channel-shaped metal reinforcing carrier 16. The material 14 is integrally extruded with the lip 12.

The metal carrier is made of channel-shaped metal, slotted or slitted to improve its flexibility. For example, it may comprise inverted U-shaped elements arranged next to each other to define the channel and either integrally connected together by short flexible connecting links or perhaps entirely disconnected from each other. Looped wire may be used instead. Other forms of carrier can be used. Along one face 16A of the carrier, it is not covered by the extruded EPDM material 14.

The material 14 is extruded to provide integral lips 18 and shoulders 20 which are directed towards each other across the width of the channel.

The carrier 16 may be incorporated in the extruded EPDM material

14 by means of a cross-head extruder.

Figure 2 shows how the structure 10 is shaped to match the shape of the moulded TPO material 10. The structure 11 is secured to the TPO material 10 using a suitable adhesive. This adhesive is applied between the TPO material 10 and the lip 12 along a surface 26, between the TPO material 10 and the surface 16A of the carrier 16 where it is not covered by the extruded EPM material 14, and along a further surface 27.

When the strip 5 is mounted in position on the vehicle body, the channel 28 of the structure 11 embraces a supporting flange 30 running along the waist of the door alongside the gap 32 through which the window glass is raised and lowered. The channel 28 grips the flange 30 and thus supports the strip 5 along the waist. The gripping process is assisted by the lip 18 and the shoulders 20,22. Advantageously, the lips 18 can be co-extruded so as to be relatively soft, compared with the rest of the extruded material 14, to increase their frictional grip on the flange. The channel 28 thus supports the structure 11 so that the lip 12 is positioned alongside the gap 32 through which the glass pane moves. The lip 12 preferably has a flocked surface 34 for making a good low friction seal on the outer face of the

glass.

A suitable seal (not shown) is preferably provided to run along the waist of the door on the opposite side of the gap 32 so as to seal against the inner surface of the glass.

It will be appreciated that the TPO material 10 need not be adhesively secured to the extruded structure but may be directly moulded thereto.

Figure 3 shows the form which the strip 5 takes over the region between points A and B in Figure 1. Over this region, the moulded TPO material defining the outer face 5A of the strip is shown at 40. The moulded material comprises a generally L-shaped portion with one limb of the L folded over on itself to define a slot 42. Over the length AB, the strip 5 is mounted within a metal mounting channel 44 forming part of the window frame for the opening 6 (Fig. 1). The side walls of the channel 44 define flanges 44A and 44B where the channel is secured (as by welding) to the outer and inner door panels. The moulded part 40 of the seal 5 is mounted in the channel 44 so that its slot 42 is engaged over the flange 44A of the channel 44. The other limb of the "L" lies in the base of the channel 44 and is provided

with lips 46 and 48 which engage under inwardly directed shoulders 50 and 52 of the channel 44.

In addition, over the region AB the strip 5 incorporates an extruded structure 54. The structure 54 is extruded from EPDM material 56 to define a channel-shaped part 58 and two lips 60 and 62. The channel-shaped part 58 incorporates a metal carrier 64 which may be of similar construction to the metal carrier 16 of Figure 2. The extruded EPDM material 56 defines integral lips 66 and shoulders 68 corresponding to the lips 18 and the shoulders 20 of Figure 2. Along a surface 70, the extruded EPDM material is profiled to match the profile of the lower limb of the moulded part 40.

As shown, the structure 54 is mounted on the flange 44B, the channel-shaped part 54 firmly gripping the flange 44B.

In this way, the moulded part 40 and the extruded structure 54 together define opposite walls of a glass run channel 72 in which the window glass 76 is positioned. The outer face 76A of the glass 76 makes sealing contact against a flocked surface 78 on the moulded part 40. The inner face 76B of the window glass 76 makes contact with a flocked surface 80 on the lip 60. Lip 62

has a flocked surface 82 which makes sealing contact with the edge 76C of the glass 76.

The moulded part 40 and the extruded structure 54 can be adhesively secured to each other along the line 70. However, this is not necessary because the two parts are held in the correct position relative to each other by their respective engagement with the flanges 44A and 44B.

The strip 5 is thus advantageous because it uses a moulded construction, made from TPO, for the outwardly facing surface of the strip, producing a pleasing appearance and a construction in which the sharp corners in the seal can be produced integrally during the moulding operation. The possibility of slight change in colouration at the sharp corners, which can occur when extruded lengths of sealing strip are connected together at sharp corners by separately moulded inserts, is thus avoided. In addition, the use of the extruded structures on the inside face of part of the seal 5 ensures very effective sealing against the glass surface, TPO not being so effective as sealing material.

In the foregoing description, it will be appreciated that the moulded TPO sections may be directly moulded onto the extruded

parts and need not be secured by adhesive.

Referring to the modified strip of Figure 4, the TPO moulded part 10 is formed in a different shape and extends along the lip 12 as shown.

The TPO 10 are directly moulded onto the extruded part 11. It will be appreciated that the TPO 10 need not be directly moulded onto the extruded part 11 but may be adhesively secured thereto using a suitable adhesive.

Referring to the modified strip of Figure 5, the extruded part 54 is now generally channel-shaped. The extruded part 54 is provided with a first TPO moulded section 90 (shown on the left hand side of Figure 5) defining the outer face 5A of the strip as shown in Figure 5. Additionally, a second TPO moulded section 92 is provided on the right hand side of Figure 5 defining the face 5B of the strip.

The TPO moulded sections 90,92 are directly moulded onto the extruded part 54. However, it will be appreciated that the TPO sections 90,92 need not be directly moulded onto the extruded part 54 but may be adhesively secured thereto.

In the modified strip of Figure 5, the channel-shaped carrier 64 is omitted. However, it will be appreciated that a carrier may be incorporated if desired.

The modified strip of Figure 5 is thus advantageous because it uses a moulded TPO construction for the outwardly and inwardly facing surface of the strip, producing a pleasing appearance on the exterior and interior of the vehicle.

Figure 6 shows a further modified strip in which the second TPO section 92 of Figure 5 is extended along the uppermost surface of the lip 60. This TPO section 92 is directly moulded onto the extruded part 54. However, it will be appreciated that the TPO section 92 may be adhesively secured to the extruded part 54.

In the modified strip of Figure 6 the carrier 64 is omitted. However a suitable carrier may be incorporated if required.

The TPO section 92 again provides a pleasing appearance on the interior of the vehicle.

CLAIMS

1. A sealing, trimming or guiding strip, comprising first strip means extending along the length of the strip and defining a first longitudinally extending face thereof and second strip means extending along at least part of the length of the strip and defining the second, opposite, longitudinally extending face of the strip, at least one said strip means being of one-piece moulded construction and the strip incorporating longitudinally extending extruded material.
2. A strip according to claim 1, in which both strip means are of the one-piece moulded construction, and the extruded material is between the two strip means.
3. A strip according to claim 1, in which the first strip means is of the one-piece moulded construction, and the second strip means incorporates the extruded material.
4. A strip according to any preceding claim, in which along at least part a portion of the said part of the length of the strip the two strip means are arranged together to define a guiding

channel.

5. A strip according to claim 4, in which the two strip means defining the guiding channel are held adjacent to each other by being mounted on respective generally parallel supports but are not otherwise attached to each other.

6. A strip according to claim 5, in which the two supports are opposite side walls of a rigid channel, the two strip means respectively embracing the side walls and at least one of the strip means also extending along the base of the rigid channel.

7. A strip according to claim 6, in which at least one of the strip means defines one or more lips extending partway towards the other of the strip means across the guiding channel.

8. A strip according to any preceding claim, in which along at least a portion of the said part of the length of the strip the or each strip means of the one-piece moulded construction is adhesively secured to the extruded material.

9. A strip according to any one of claims 1 to 7, in which along at least a portion of the said part of the length of the

strip the or each strip means of the one-piece moulded construction is moulded onto the extruded material.

10. A strip according to any preceding claim, in which along at least a portion of the said part of the length of the strip the second strip means includes metal reinforcement at least partially embedded in the extruded material.

11. A strip according to claim 10, in which the part of the second strip means in which the metal reinforcement is at least partially embedded defines a channel, and in which the first strip means is adhesively secured to an outside wall surface of that channel.

12. A strip according to claim 11, in which the material of the second strip means defining the channel also defines a lip extending away from an outside wall surface of that channel.

13. A strip according to any preceding claim, in which the moulded material is a thermoplastic olefin (TPO).

14. A strip according to any preceding claim, in which the extruded material is EPDM.

15. A strip according to any preceding claim, in the form of at least one closed loop for surrounding a window opening and sealing a window glass.

16. A sealing, trimming or guiding strip for a window frame in a motor vehicle body, the strip comprising first strip means defining a first longitudinally extending face of the strip, the first strip means being in the form of a continuous closed loop produced by a single moulding operation and having at least one sharp angled corner matching a sharp angled corner of the window frame, and second strip means extending longitudinally along the strip and around the closed loop of the first strip means to define the second, opposite, longitudinal face of the strip and incorporating extruded material, the first face of the strip being the face of the strip intended to be on the outside of the vehicle in use and the second face being the face intended to be on the inside of the vehicle in use.

17. A strip according to claim 16, in which the second strip means comprises first and second parts each extending along a respective part, only, of the length of the strip, the first and second strip parts being of respectively different shapes.

18. A strip according to claim 17, in which the first part of the second strip means and the first strip means extending therealong together define a window glass receiving channel for receiving the window glass.

19. A strip according to claim 18, in which the window glass receiving channel has one side wall and its base defined by the first strip means and its other side wall defined by the first part of the second strip means.

20. A strip according to claim 19, in which the window glass receiving channel is mounted in a rigid support channel.

21. A strip according to claim 20, in which the first part of the second strip means and the first strip means extending therealong are held in juxtaposition with each other by the rigid support channel but are not otherwise connected together.

22. A strip according to claim 20 or 21, in which the first part of the second strip means is of channel-shaped construction to embracingly grip one side of the rigid support channel.

23. A strip according to claim 22, in which the first strip

means extending along the first part of the second strip means defines a channel embracing the other side wall of the rigid support channel.

24. A strip according to any one of claims 17 to 23, in which the second part of the second strip means is channel-shaped and the first strip means extending therealong is adhesively secured along an outside wall surface of that channel.

25. A strip according to claim 24, in which the second part of the second strip means incorporates an integral lip extending on and away from an outside wall surface of its channel.

26. A strip according to claim 24 or 25, in which the extruded material of the second strip means incorporates metal reinforcement.

27. A strip according to any one of claims 17 to 26, in which the first and second parts of the second strip means do not together extend around the whole length of the closed loop, the remaining part of the loop comprising only the first strip means.

28. A strip according to claim 27, in which the said remaining

part of the loop defines a channel.

29. A strip according to any one of claims 16 to 23, including a second loop integral with the first loop and at least part of the length of the second loop being common to a corresponding part of the length of the first loop, the second loop forming a frame for a second window, the second loop being moulded integrally with the first strip means.

30. A strip according to claim 29, in which the second loop defines a continuous channel for receiving a window glass for second window.

31. A strip according to any one of claims 16 to 30, in which the moulded material is a thermoplastic olefin (TPO).

32. A strip according to any one of claims 16 to 31, in which the extruded material is EPDM.

33. A strip according to any one of claims 16 to 32, in which first strip means is adhesively secured to the second strip means.

34. A strip according to any one of claims 16 to 32, in which the first strip means is moulded directly onto the second strip means.

35. A sealing, trimming and guiding strip for a window opening, substantially as described with reference to the accompanying drawings.



Application No: GB 9619576.3
Claims searched: 1-35

Examiner: John Rowlatt
Date of search: 29 April 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): B5A: AA3.
E1J: JGN, JM.

Int Cl (Ed.6): B60J: 10/00, 10/02, 10/04, 10/06, 10/08, 10/10, 10/12.
B60R: 13/06.
E06B: 7/16, 7/22, 7/23.

Other: Online: World Patents Index, EDOC, JAPIO.

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB2294964A	(DRAFTEX INDUSTRIES LIMITED) - see lip 42 moulded onto extruded section 32.	1, 3, 9, 10, 13-16, 31, 32, 34.
X	GB2294284A	(DRAFTEX INDUSTRIES LIMITED) - see page 4, lines 15-17.	1, 3, 8, 10-16, 31-33.
X	GB2290820A	(DRAFTEX INDUSTRIES LIMITED) - see page 5, lines 7-9.	1, 3, 8, 13-16, 31-33.
X	GB2273734A	(DRAFTEX INDUSTRIES LIMITED) - see page 4, lines 14-17.	1, 3, 8, 10-16, 31-33.
X	GB1590398A	(ETABLISSEMENTS MESNEL) - see page 1, lines 19-30. Equivalent US 4183778	1, 3, 8, 10-16, 31-33.

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.
& Member of the same patent family

A Document indicating technological background and/or state of the art.
P Document published on or after the declared priority date but before the filing date of this invention.
E Patent document published on or after, but with priority date earlier than, the filing date of this application.



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Application No: GB 9619576.3
Claims searched: 1-35

Examiner: John Rowlatt
Date of search: 29 April 1997

Category	Identity of document and relevant passage	Relevant to claims
X	EP0684158A1 (GENCORP INC.) - see figures 2a & 2b.	1, 3-5, 9, 13-16, 31, 32, 34.
X	EP0678412A1 (THE STANDARD PRODUCTS COMPANY) - see figure 10.	1, 3, 9, 10, 13-16, 31, 32, 34.
X	EP0628439A1 (GENCORP INC.) - whole document relevant.	1, 3-7, 13-16, 31, 32.
X	EP0479643A1 (HUTCHINSON) - whole document relevant.	1, 2, 9, 13-16, 31, 32, 34.
X	WO95/34445A1 (DECOMA INTERNATIONAL INC.) -whole document relevant.	1, 3, 8, 13-16, 31-33.
X	US5407628A (NOZAKI & SUMI) - see strips 22 & 23 moulded onto extruded section 2.	1, 2, 4, 9-16, 31, 32, 34.
X	US5343609A (McMANUS) - whole document relevant.	1-7, 9, 10, 12-16, 31, 32, 34.

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.